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(54) Indoor game pieces

(57) A set of game pieces, such as dominoes or cards, comprises a number of subsets, one such of which is shown in Figure 1. Each subset has its own indicia (the filled circle) on every piece and twice on one piece. The other pieces of the subset also bear one of a series of indicia (the hollow circles). This series is common to each of the subsets. Some or all of the pieces may be replaced by two pieces (Figures 2,3). Some of the pieces of the set may be removed for play. Electronically generated representations of the pieces may replace the actual pieces.

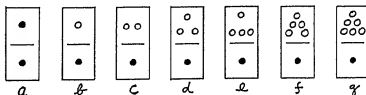


FIG 1

1/2

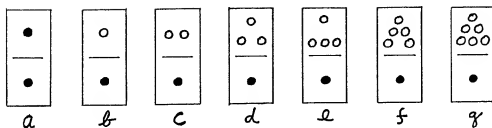


FIG 1

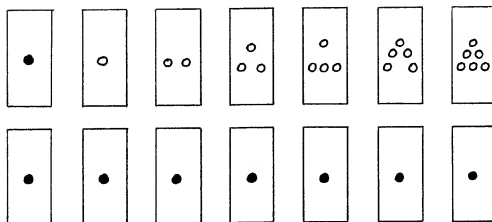


FIG 2

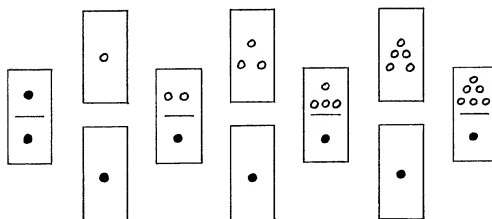


FIG 3

2/2

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	S					
M	1	2	3	4	5	6
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙	✓	✓			✓	✓
⊙ ⊙ ⊙	✓	✓			✓	✓
⊙ ⊙ ⊙	✓		✓	✓		✓
⊙ ⊙ ⊙	✓		✓	✓		✓
D	✓	✓	✓	✓	✓	✓

FIG 4

	S					
M	1	2	3	4	5	6
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙	✓		✓	✓	✓	
⊙ ⊙ ⊙	✓			✓	✓	✓
⊙ ⊙ ⊙	✓	✓			✓	✓
⊙ ⊙ ⊙	✓	✓	✓			✓
⊙ ⊙ ⊙		✓	✓	✓		✓
D	✓	✓	✓	✓	✓	✓

FIG 5

	S					
M	1	2	3	4	5	6
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙	✓	✓	✓		✓	
⊙ ⊙ ⊙	✓		✓	✓		✓
⊙ ⊙ ⊙	✓			✓	✓	✓
⊙ ⊙ ⊙	✓			✓	✓	✓
D	✓	✓	✓	✓	✓	✓

FIG 6

	S					
M	1	2	3	4	5	6
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙		✓	✓	✓	✓	
⊙ ⊙ ⊙	✓		✓	✓	✓	✓
⊙ ⊙ ⊙	✓	✓	✓	✓		✓
⊙ ⊙ ⊙	✓	✓			✓	✓
⊙ ⊙ ⊙	✓	✓			✓	✓
D	✓	✓	✓	✓	✓	✓

FIG 7

SPECIFICATION

New families of sets of game pieces for playing games

5 *Description* 5

This invention relates to families of sets of game pieces such as dominoes, tiles or cards used for playing games.

According to the present invention there are provided families of sets of game pieces used for playing games, sets being automatically designed in outline on specifying independent positive whole numbers for x and n , by rules and procedures giving effect to (a) through to (g) below;

- 10 (a) determining the number of subsets in a set, 10
 (b) deciding the number of game pieces in each subset,
 (c) defining the number and type of categories of indicia in a set,
 (d) fixing the maximum number (rank) of the multiple indicia category,
 15 (e) allocating categories of indicia to the subsets, 15
 (f) assigning categories of indicia to the game pieces in the subsets,
 (g) organising the indicia on the individual game pieces of each subset.

These rules and procedures, given in detail on pages 3 and 6, specify complete twin region sets and unless stated otherwise the game pieces, subsets etc. described are for twin region sets. Single region and mixed 20 twin and single region sets are derived from twin region sets and are described separately on page 7. Reduced and enlarged sets are described on pages 8 & 9. 20

Sets are labeled according to the numerical values of x and n employed, for example $[x,n]$ set could be $[6,6]$ or $[5,10]$ or $[15,7]$ etc., where the value for x is always placed before that for n .

- 25 All game pieces carry distinguishing marks or indicia and these marks or indicia are classified into categories. The game pieces are grouped into subsets according to one category of the indicia carried and a set 25 is made up of a number of these subsets.

On choosing values of x and n for a set, the following rules and procedures determine the outline design of the set;

- (a) The number of subsets in the set is x .
 30 (b) The number of game pieces in each subset is $n+1$. 30
 (c) the number of categories of indicia in a set is $x+1$, made up of one multiple category M , and x single categories S or $S(x)$,
 (d) the maximum number or rank of the multiple indicia category is n ,
 (e) two categories of indicia are allocated to each subset, M and one of $S(x)$, each $S(x)$ category being 35 allocated in turn to each subset, 35
 (f) both M and $S(x)$ categories are assigned to each of n game pieces and only $S(x)$ indicia to the remaining game piece in each subset.

- (g) in the n game pieces of each subset assigned M indicia, one region only of each piece is marked successively with one through to n with M indicia, all the remaining regions on all the $n+1$ pieces in the 40 subset are marked with a solitary indicium of $S(x)$. 40

The design of the set is completed by detailing the indicia, and sizing, positioning and grouping them on the individual game pieces.

Figures 1, 2 & 3 show typical twin region, single region and mixed twin and single region subsets respectively, all subsets from $[6,6]$ sets.

- 45 Figures 4, 5, 6 & 7 show examples of reduced twin region $[6,6]$ sets. 45

The game pieces can be made from a wide range of materials, singly or in combination. Suitable materials include plastics, bone, wood, stone, metal, glass, ceramic, paper, card, impregnated fabric or other woven material. The indicia carried by the game pieces can take any one, two or three dimensional form including lines, flat circular discs (spots) and sections of spheres. The indicia can be painted, printed, cast, inserted, 50 carved, stuck, or transferred etc. on, in or to the game pieces. 50

Alternatively, representations of the game pieces can be electronically generated and stored by a computer, and shown for example on one or more Visual Display Units or monitor screens, allowing games to be played by either persons alone, in pairs or other small groups against a computer program, or persons alone, in pairs or other small groups with the aid of a computer program, against other such persons alone or in 55 groups. 55

- The individual game pieces are usually flat two sided laminae of any shape although rectangular shapes are preferred. It is usual for one face only of the game pieces to carry indicia, the "game" face; the other or "back" face is left blank or marked with an abstract pattern or a picture, symbol, advertisement etc., singly or in combination. A set can be unified by employing these or similar devices and/or the same base colour on the back faces; and also by employing the same or a different unifying base colour on the game faces. The game faces are divided into two regions or "halves" usually but not necessarily of equal area, separated by a real or an imaginary line or marker. This line or marker can be straight, curved or even jagged and is normally drawn between the mid-points of the long sides of rectangular faces, but it could be drawn elsewhere, for instance diagonally across a rectangular face, or otherwise for alternatively shaped game faces. Each region 60 of a game face carries an indicium or indicia of one category only and no region is left blank. 65

Categories of indicia

The indicia marking the game faces have the following parameters, shape, colour, number, size and position. They are usually categorised according to the shape, colour and number combination, but other categories based on these five parameters are possible. For a complete $[x, n]$ set of game pieces the number $(x + 1)$ of these shape/colour/number combinations or other categories of indicia are selected and exclusively used in the set.

(1) *Shape* Indicia can be linear, flat and two dimensional, or of three dimensions; and of regular or irregular shape. Examples could include straight or curved lines, circular and semi-circular discs, spherical and semi-spherical forms, triangular, square, pentagonal etc. shapes, five and six pointed stars, "lightning flashes", etc., etc..

(2) *Colour* The base colour or colours chosen for the indicia are clearly defined and differentiated from each other. The colours span the full spectrum of colours and include "non-colours" such as black and white, and colours formed from combining any two or more of these colours. Shadow and/or highlighted areas of different colours can be superimposed on and around two dimensional indicia to give an illusion of three dimensions, or other effects simulated by the addition, subtraction or superimposition of various colours on or around the indicia.

(3) *Number* Of the $(x + 1)$ categories of indicia chosen for a set, ONE only is designated for multiple use and is labeled M. All the remaining x categories of indicia, jointly labelled S or $S(x)$ and belonging to the family $S(1), S(2), \dots, S(x)$, are designated for single use.

Single use means that a solitary indicium is the sole occupant of the region on each game piece to which it is assigned.

Multiple use means that indicia occupy the region on each game piece to which they are assigned in numbers which range from one successively through to a maximum of n , as illustrated for $n = 6$ in Figure 1 game pieces (b) to (g). The multiple indicia markings of one through to n on individual game pieces are called numbered ranks, and when present in numbers of two or more (ie. of second rank and above) can be arranged in various configurations, groups, clusters, or randomly or in any combination of these.

(4) *Size/Position* Within a set the size of the indicia of each shape/colour/number or other category, and their positions within the regions of the game pieces to which they are assigned, can separately or in combination be either fixed and constant or vary and differ.

Subsets

TWO categories of indicia are allocated to each subset, the multiple indicia of category M, and ONE of the single indicia categories $S(1), S(2), \dots, S(x)$; each $S(x)$ category being assigned in turn to each of the subsets making up the complete set.

Within each subset n game pieces are assigned both categories of indicia, the remaining one being assigned only category $S(x)$ indicia.

The game piece assigned only category $S(x)$ indicia is the double, a single $S(x)$ indicium occupying both regions of the game piece. In the other n game pieces of the subset one region of each piece is occupied by a single indicium of category $S(x)$, the remaining region of each piece being marked successively with one through to n indicia of category M, ie. with 1st to n th ranks of category M indicia.

A complete subset from a $[6, 6]$ set is shown in Figure 1, in which (a) is the double and (b) to (g) the remaining $n = 6$ game pieces.

A complete $[x, n]$ set

A complete $[x, n]$ set is composed of x subsets, each subset containing a double and one from each rank of multiple indicia game pieces. A complete twin region $[x, n]$ set is therefore made up of x doubles together with x of each of the n ranks of multiple indicia game pieces, a total of $x \cdot (n + 1)$ game pieces.

Single region sets

Single region sets are derived from their twin region counterparts by splitting or separating each twin region game piece into two along the real/imaginary line between the two regions, doubling the number of game pieces but eliminating doubles as such within the set. Individual game faces in single region sets carry indicia of only one category.

Single region sets have different playing characteristics to their twin region counterparts and greater flexibility and freedom is provided with these sets when constructing reduced or enlarged sets described below. Figure 2 shows the single region version of the Figure 1 subset.

Mixed region sets

Mixed region sets are derived from their twin region counterparts by splitting some but not all twin region game pieces into two single region game pieces. These sets are therefore made up of a mixture of both single and twin region game pieces. The pieces split are either specifically or randomly chosen.

Mixed region sets have different playing characteristics to both their twin and single region counterparts, and to alternative mixed region versions of these same counterparts. Mixed region sets provide great flexibility and freedom when constructing reduced or enlarged sets described below.

Figure 3 shows a mixed region version of the Figure 1 subset.

Reduced sets

Any complete $[x,n]$ set described in this document can be reduced by withdrawing a number of game pieces. Reduced sets with "tailor-made" or known properties and playing characteristics can be produced by the removal of specific game pieces. Doubles are preferably treated as a group and are either all left or all removed.

Figures 4 to 7 show four examples of reduction applied to twin region $[6,6]$ sets in which the doubles are all retained.

S = single category indicia, the six categories being coded 1 - 6.

M = multiple category indicia, the six ranks being shown.

D = doubles, and occupy the bottom row in each Figure.

Any square on the grid shown in each of these Figures can be linked to a specific game piece in the complete set, the row indicating rank of category M indicia or the double, the column identifying the S(x) category of indicia.

A tick indicates inclusion in the reduced set.

A blank indicates exclusion from the reduced set.

In Figures 4, 5 & 6 two game pieces are removed from the six in each rank of the complete set. In Figure 7 two game pieces are removed from each of the ranks 6, 5, 2 & 1 and only one game piece removed from each of ranks 3 & 4.

The playing characteristics of the sets illustrated can be written;

Figure 4, (4 2 4 2 4).

Figure 5, (3 3 3 3 3).

Figure 6, (4 3 2 3 4).

Figure 7, (4 3 4 3 4).

These are just a few of the numerous playing characteristics which can be devised for reduced sets, for every one of which numerous permutations are possible by interchanging the codes for the S(x) indicia.

Reduced sets with partially or totally unknown properties and playing characteristics can be created by the mainly "blind" removal of game pieces according to such procedures as,

(a) random "blind" selection from each (or not) of the n complete ranks of M multiple indicia game pieces,

(b) random "blind" selection from the undifferentiated complete set,

(c) a combination of (a) and (b),

(d) known selective removal together with any combination of (a), (b) & (c).

These procedures must be used judiciously as unplayable sets are easily created.

Enlarged or combined sets

Enlarged sets can be created using any of the sets described, in a number of ways alone or in combination, for example;

(a) pieces selected for removal from complete sets to produce any of the reduced sets described above are added to other complete sets to produce enlarged sets, or

(b) by amalgamating,

(i) two or more complete sets, or

(ii) two or more reduced sets, or

(iii) one or more complete sets with one or more reduced sets.

Enlarged sets can be designed to have "tailor-made" or known, as well as partially known and unknown playing characteristics.

Embodiments

(1) In one important embodiment sets of game pieces with visual links with the game of SNOOKER or any of its derivatives can be produced. The "snooker-linked" embodiment would usually have:

(a) $x = 6$,

(b) $n = 15$, or 10, or 6, or any integer between 15 and 6,

(c) all indicia circular or spherical, or part thereof,

(d) all indicia of identical size,

(e) the six S(x) categories of single indicia coloured yellow, green, brown, blue, pink and black,

(f) the multiple M indicia coloured red,

(g) a unifying game face base colour, preferably a shade of green but not excluding other colours such as white or even black.

Figures 1 to 7 apply to "snooker-linked" $[6,6]$ sets.

(2) In another embodiment sets of game pieces based on the game of POOL can be produced. The pool based embodiment would normally be played with enlarged or combined sets. A complete set would usually have:

(a) $x = 2$,

- (b) $n = 7$, or any integer between 15 and 6,
- (c) all indicia circular or spherical, or part thereof,
- (d) $S(x)$ indicia of identical size and larger than M indicia,
- (e) the two $S(x)$ categories of indicia of different colours, or if of identical colour then one category bearing an additional mark or marks such as a differently coloured spot or spots,
- (f) the M indicia of a different colour from the $S(x)$ indicia,
- (g) a unifying game face colour, preferably a shade of green.

CLAIMS

- 10 (1) Families of sets of game pieces used for playing games, each set being automatically designed in outline on specifying independent positive whole numbers for x and n , by the following rules and procedures;
 - (a) the number of subsets in the set is x ,
 - 15 (b) the number of game pieces in each subset is $n + 1$
 - (c) the number of categories of indicia in a set is $x + 1$, made up of one multiple category M , and x single categories S or $S(x)$,
 - (d) the maximum number or rank of the multiple indicia category is n ,
 - (e) two categories of indicia are allocated to each subset, M and one of $S(x)$, each $S(x)$ category being
 - 20 allocated in turn to each subset,
 - (f) both M and $S(x)$ categories are assigned to each of n game pieces and only $S(x)$ indicia to the remaining game piece in each subset,
 - (g) in the n game pieces of each subset assigned M indicia, one region only of each piece is marked successively with one through to n with M indicia, all the remaining regions on all the $n + 1$ pieces in the
 - 25 subset are marked with a solitary indicium of $S(x)$.
- (2) Families of sets of game pieces for playing games as claimed in claim 1 wherein all the twin region game pieces are replaced by equivalent single region game pieces.
- (3) Families of sets of game pieces for playing games as claimed in claim 1 wherein some but not all the twin region game pieces are replaced by equivalent single region game pieces.
- 30 (4) Families of sets of game pieces for playing games claimed in claims 1, 2 & 3 wherein each set a number of specific game pieces are removed, endowing the reduced sets with known playing characteristics.
- (5) Families of sets of game pieces for playing games claimed in claims 1, 2 & 3 wherein each set a number of specific game pieces plus a number of game pieces selected at random are removed, endowing the reduced sets with partially known playing characteristics.
- 35 (6) Families of sets of game pieces for playing games claimed in claims 1, 2 & 3 wherein each set a number of game pieces selected at random are removed, endowing the reduced sets with unknown playing characteristics.
- (7) Families of sets of game pieces for playing games claimed in claims 1, 2 & 3 wherein game pieces selected for removal from sets according to claims 4, 5 & 6 are added to other sets, producing enlarged sets
- 40 with playing characteristics which are known, partially known or unknown respectively.
- (8) Families of sets of game pieces for playing games claimed in claims 1, 2 & 3 wherein complete sets are combined to produce enlarged sets with known playing characteristics.
- (9) Families of sets of game pieces for playing games claimed in claims 1, 2, 3, 4, 5 & 6 wherein complete and reduced sets are combined into enlarged sets with known, partially known or unknown playing characteristics.
- 45 (10) Families of sets of game pieces for playing games claimed in claims 1, 2, 3, 4, 5 & 6 wherein reduced sets are combined into enlarged sets with known, partially known or unknown playing characteristics.
- (11) Groups of sets within the families of sets of game pieces for playing games claimed in claims 1, 2, 3, 4, 5, 6, 7, 8, 9 & 10 wherein each set is linked to the game of snooker or derivatives of the game of snooker by
- 50 choosing;
 - (a) $x = 6$,
 - (b) $n = 15, 10$ or 6, or any integer between 15 and 6,
 - (c) the colours yellow, green, brown, blue, pink and black for each of the six $S(x)$ categories of indicia,
 - (d) the colour red for the M category of indicia.
- 55 (12) Groups of sets within the families of sets of game pieces for playing games claimed in claims 1, 2, 3, 4, 5, 6, 7, 8, 9 & 10 wherein each set is based on the game of pool or derivatives of the game of pool and in which;
 - (a) $x = 2$,
 - (b) $n = 7$, or any integer between 15 and 6.